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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US00/05663 (22) International Filing Date: 03 March 2000 (03.03.2000) (30) Priority Data: 09/263,368 05 March 1999 (05.03.1999) US (60) Parent Application or Grant CHEN, Jian [/]; O. LEE, Angela, T. [/]; O. CHEN, Jian [/]; O. LEE, Angela, T. [/]; O. VIERRA, Larry, E. ; O.	Published			
(54) Title: SYSTEM AND METHOD FOR SECURE TIME-SHARED ELECTRONIC ACCESS PARCEL DISTRIBUTION (54) Titre: SYSTEME ET PROCEDE DESTINES A L'ACCES ELECTRONIQUE EN TEMPS PARTAGE POUR LA DISTRIBUTION SECURISEE D'UN COLIS				
(57) Abstract <p>A method and system for receiving parcels in a secure manner. The method comprises the steps of: providing a plurality of controlled receptacles (14), acquiring recipient data (30) and parcel data (34), dynamically assigning (36) an appropriately-sized container based on parcel size data prior to the delivery of the parcel, accepting delivery to the container, identifying the recipient upon presentation of identification by the recipient, and releasing (40) the parcel to the recipient. The system includes a plurality of securable storage containers (14), a controller (18) coupled to the securable storage containers (14), and a memory (18) coupled to the controller. The memory (18) contains a database of parcel delivery and recipient information, a database of container status, and program code. The program code directs the controller (18) to allow access to the storage containers (14), and dynamically assigns (36) containers (14) to allow parcels to be stored in one of the securable storage containers (14).</p> (57) Abrégé <p>L'invention porte sur un procédé et un système utilisés pour la réception sécurisée de colis. Le procédé selon l'invention comprend les étapes suivantes : fournir divers conteneurs de stockage (14) placés sous contrôle, acquérir les données concernant le destinataire (30) et les données concernant le colis (34), attribuer d'une façon dynamique (36) un conteneur aux dimensions appropriées en fonction des dimensions du colis avant la livraison du colis, accepter la livraison du colis dans le conteneur, procéder à l'identification du destinataire sur présentation d'un justificatif d'identité, délivrer (40) le colis au destinataire. Le système comprend un ensemble de conteneurs de stockage (14) pouvant être fixés, un contrôleur (18) reliés aux conteneurs de stockage (14) pouvant être fixés et une mémoire (18) reliée au contrôleur. La mémoire (18) contient une base de données des informations concernant la livraison du colis et le destinataire, une base de données sur l'état du conteneur et un code programme. Le code programme dirige le contrôleur (18) afin de permettre l'accès aux conteneurs de stockage (14) et attribue, de façon dynamique (36), les conteneurs (14) pour permettre le stockage des colis dans un des conteneurs de stockage (14) pouvant être fixés.</p>				

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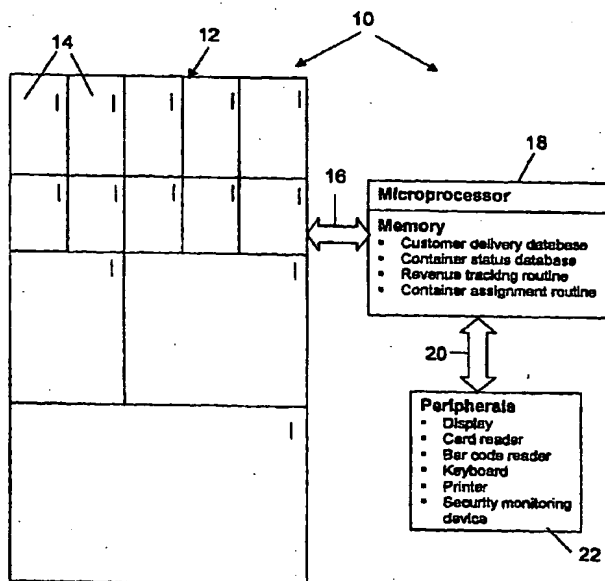
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(54) Title: SYSTEM AND METHOD FOR SECURE TIME-SHARED ELECTRONIC ACCESS PARCEL DISTRIBUTION

(57) Abstract

A method and system for receiving parcels in a secure manner. The method comprises the steps of: providing a plurality of controlled receptacles (14), acquiring recipient data (30) and parcel data (34), dynamically assigning (36) an appropriately-sized container based on parcel size data prior to the delivery of the parcel, accepting delivery to the container, identifying the recipient upon presentation of identification by the recipient, and releasing (40) the parcel to the recipient. The system includes a plurality of securable storage containers (14), a controller (18) coupled to the securable storage containers (14), and a memory (18) coupled to the controller. The memory (18) contains a database of parcel delivery and recipient information, a database of container status, and program code. The program code directs the controller (18) to allow access to the storage containers (14), and dynamically assigns (36) containers (14) to allow parcels to be stored in one of the securable storage containers (14).



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Description

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SYSTEM AND METHOD FOR SECURE TIME-SHARED ELECTRONIC ACCESS
PARCEL DISTRIBUTIONBACKGROUND OF THE INVENTIONField of the Invention

This invention relates to the highly efficient distribution of parcels to large number of users with security and ease of use.

Description of the Related Art

The distribution of parcels has been traditionally achieved by delivery of parcels to an individual's residence or place of business. A major source of residential shipments has been as a result of the goods bought by individuals through catalog, television, telephone, or Internet sales. The volume of this segment of residential parcel shipping is expected to grow significantly with the explosive growth of online shopping transactions over the Internet. The current system has many associated problems and inefficiencies as explained below. These problems and inefficiencies are expected to become more significant as the volume of residential parcel shipments increase.

One problem of residential delivery is that commercial carriers generally deliver only during the daytime when many individuals are not at home to receive the parcel. If the carrier deems the recipient's home to be in a safe area, the carrier may leave the parcel at the door. This is not possible if the area is not deemed safe or a signature is required as proof of receipt. Even if the area is deemed safe, in some cases there is no adequate protection from the elements and the carrier will not leave the parcel. Carriers will not leave parcels unattended at the door of apartment units due to high foot traffic and the associated risk of theft. In case a parcel cannot be left at the door for any of the above reasons, the carrier must make a second or even a third trip to the recipient's address which is highly inefficient for the carrier. Furthermore, the recipient is inconvenienced due to the delay when the parcel is not delivered the first time.

Another problem of residential delivery is that if the parcel is left unattended and unsecured, there is likelihood of theft of the parcel. In case of theft, the recipient is highly inconvenienced. The recipient needs to file a complaint with the merchant and/or the carrier. In some cases, the claim may never be resolved; and, the recipient may never receive a replacement of the ordered merchandise. Even if the merchant or the carrier replaces the lost parcel, the receipt of the parcel is delayed significantly from the originally expected receipt date. The merchant or carrier incurs additional cost of replacement of

the stolen merchandise.

Another problem of residential delivery is that it is more expensive for a carrier to provide than commercial delivery because the delivery density (the number of deliveries in a given area) is significantly lower for residential delivery than commercial delivery. Furthermore, a residential delivery point (e.g. a building or other point of egress for a delivery driver) typically receives a single parcel while a commercial delivery point typically receives multiple parcels per delivery. Residential delivery is also more expensive for the carrier to provide because many times second or third trips have to be made for a residential delivery, as described previously. In order to cover the higher cost, some carrier companies currently charge a surcharge for residential deliveries.

Another problem of residential delivery is that in case a recipient wishes to purchase an item in privacy, it is often not possible if he or she has others living in the same residence.

One currently available alternative to residential delivery which partially solves some of the problems mentioned above is the U.S. Postal Service, P.O. Box system or similar private systems. In such systems, the consumer pre-rents space to receive parcels: a single user rents a particular single receptacle, such as a mailbox for a period of time, typically a minimum of three months. The authorized occupant of a mailbox possesses a mechanical key, which allows access to the mailbox.

These systems do not address all the problems set forth above and present their own additional problems. In the case of the U.S. Postal Service P.O. Box system, only the U.S. Postal Service can make deliveries to a P.O. Box. Furthermore, the fact that an individual must rent a mailbox for a period of time restricts the individual to receive parcels at only the location at which the individual has rented a mailbox. These systems also suffer from the disadvantage that a single receptacle is occupied by an user at all times even when the user is not expecting any parcels. This means that as the number of users become large, it becomes highly inefficient or impossible to have designated receptacles for each and every user. The need of one receptacle per recipient at all times translates to high cost to the consumer. Another problem is that because of the large number of receptacles needed, the receptacles are made small due to space limitations. This means that many parcels do not fit the receptacle and the recipient can pick up the parcel only during limited hours when an attendant is available. The need for an attendant to be on duty to store and distribute oversized parcels translates to inconvenience and high cost to the consumer.

A further potential problem associated with the increase of individuals shopping online over the Internet is the potential for online credit card fraud. In case the credit card number and cardholder name information is stolen, the thief can order goods online

without ever having to present the physical card and have items delivered without secure acceptance procedures. This is a problem for the consumer, merchants, shipping companies and credit card companies. It will be to the benefit of all parties involved in the e-commerce transaction to have a solution.

An alternative prior art system is presented in U.S. Patent No. 5,475,378 to Kaarsoo which discloses an electronic access control mailbox system which consists of: one or more mailboxes, each consisting of a compartment with an electrically controlled lock, a card reader for reading identification data, and control means. This delivery system however suffers from the disadvantage that a recipient must have a pre-established relationship with the provider in order to receive parcels there. Furthermore, a single compartment is occupied by a user at all times even when the user is not expecting any parcels. This means that as the number of users become large it becomes highly inefficient, expensive, or impossible to have designated compartments for each and every user. Also since the user achieves access of mailboxes by presenting a card key, problems of unauthorized entry occur when said card key is lost or stolen.

SUMMARY OF THE INVENTION

The disadvantages heretofore associated with the prior art are overcome by the present invention of a method and system for receiving and securely holding a parcel until the parcel's pickup by recipient.

In one aspect, the invention is a method for receiving parcels, comprising: providing a plurality of controlled receptacles, acquiring recipient data and parcel data, dynamically assigning an appropriately-sized container and parcel size data prior to the delivery of the parcel, accepting delivery of parcel to the container, identifying the recipient upon presentation of identification by the recipient, and releasing the parcel to the recipient.

In an alternative embodiment, the invention is a secure parcel storage system. The system includes a plurality of securable storage containers, a controller coupled to the securable storage containers, and a memory, coupled to the controller. The memory contains a database of parcel delivery and recipient information, a database of container status, and program code. The program code directs the controller to allow access to the storage containers, and dynamically assigns containers to allow parcels to be stored in one of the securable storage containers.

The system and method for secure time-shared electronic access parcel distribution is advantageous in that the assignment of receptacle to parcel is done dynamically such that a recipient only reserves and rents a receptacle when it is known that a parcel is expected. The recipient can choose to use the service at the time a

5 purchase of merchandise is made, without any prior commitment, obligation, or up-front
cost. Furthermore, the recipient can choose the pickup location of the recipient's
10 preference. The pickup locations may be widely distributed geographically, such that a
pickup point most convenient to the recipient may be used. The above mentioned
5 dynamic assignment of receptacles makes it also possible for a relatively small number
of receptacles to provide service to a relatively large population; therefore, making it
15 possible to have receptacles of various sizes to accommodate parcels of various sizes.

The system and method for secure time-shared electronic access parcel
distribution is akin to a "rented hotel room" model where an individual only reserves and
10 rents a room when one has a need to occupy it. The individual decides when and where
to rent a parcel receptacle at the time one knows when and where a receptacle is needed.
20 The enclosure, "parcel storage receptacle," is time-shared among multiple individuals for
increased efficiency and cost effectiveness.

In contrast, systems such as the U.S. Postal Service P.O. Box and other
15 mailboxes for rent are akin to a "leased apartment" model where an individual leases an
apartment for a set period of time. The lessee is obligated to pay rent for the apartment
for the contracted period of time regardless of whether the lessee occupies the apartment.
25 In the same way, the renter of a mailbox is obligated to pay rent for the contracted time
regardless of whether parcels are expected and received there.

30 Another advantage of the invention is that each access to a receptacle is logged
such that the status of each receptacle is continuously known. A receipt acknowledging
parcel delivery may be provided to the carrier and the merchant when a parcel is
received. Furthermore, once a parcel is received in a receptacle, the parcel is secured
35 against unauthorized pickup or theft. The recipient is notified at the time the parcel has
been received such that the recipient may come for pickup at his or her earliest
convenience. In automated embodiments of the invention, the recipient may pick up the
parcel at any time that is convenient to the recipient, not bound by limited attendant's
40 hours. Another advantage of the invention is that the recipient may pickup the parcel in
total privacy. The recipient's access to the receptacle is granted by password entry,
30 thereby minimizing need for physical keys. It is further an advantage of the invention to
provide a method where access to the receptacle can be made conditional upon the entry
of the correct password as well as valid physical identification, such as credit card,
45 whereby online credit card fraud and other unauthorized access is deterred. The service
fee, if needed, may be charged to the recipient, merchant, or carrier. If needed, late
35 pickup penalty is charged to the recipient.

50 The system and method for secure time-shared electronic access parcel
distribution allow commercial carriers to achieve higher efficiency and lower overall

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delivery cost as compared to traditional residential delivery by allowing delivery of a large number of parcels to one centrally located location, and also eliminating second or third delivery trips. The system and method further increases efficiency by allowing delivery of many carriers to be accepted at one centrally located location.

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The system and method for secure time-shared electronic access parcel distribution may be automatically operated without attendants for the receiving and distribution of parcels; thereby, allowing the service to be provided at a lower cost than traditional attendant operated mailbox systems. The system and method may be run automatically by issuing the delivery receipt and notification to recipient electronically. The status and operation of the system may be managed remotely over a communication system, such as the Internet. Information, such as relating to the receptacle status and fees collection, may be controlled and monitored through an information system, such as the Internet.

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These and various other advantages and features of novelty that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

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The invention will be described with respect to the particular embodiments thereof. Other objects, features, and advantages of the invention will become apparent with reference to the specification and drawings in which:

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Figure 1A is a block diagram of a local parcel receiving and storage unit of the present invention.

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Figure 1B is a schematic view of one exemplary embodiment of a local unit in an exemplary configuration.

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Figure 2 depicts a flowchart for one embodiment of a method of receiving parcels in accordance with the present invention.

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Figure 3 is a block diagram of a parcel receiving and control system, including multiple local units and a central control unit, in accordance with a further embodiment of the present invention.

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Figure 4 is a block diagram of yet another embodiment of the system of the present invention including multiple local units and a central control unit, which resides with the carrier.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following description, numerous details, for example, specific materials, process steps, etc., are set forth in order to provide a thorough understanding of the invention. It will be readily understood, however, to one skilled in the art that the specific details need not be employed to practice the present invention. Moreover, specific details of particular processes or structures may not be specifically presented in order not to unduly obscure the invention where such details would be readily apparent to one of average skill in the art.

The system and method disclosed herein find applicability in the delivery of many types of parcels, such as remotely ordered merchandise, letters, periodicals, gifts, and groceries, among other applications. Referring to Figure 1A, illustrated therein is a block diagram of one aspect of the system of the present invention. In this aspect, a local unit 10 suitable for allowing delivery of parcels in a secure manner includes a locker of securable storage receptacles 12, a local unit controller 18, and peripherals 22. The local unit is designed to be operated at any number of locations in a manual, semi-automatic, or fully automatic manner. As described fully with respect to Figure 2, the parcels are delivered to and returned from the storage containers of the local unit in accordance with the method of the present invention. In brief, the locker of secure receptacles provides carriers with a verifiable drop point for the parcels shipped to customers, ensuring only one delivery trip for the paid delivery person, and the recipient with a secure platform from which to receive parcels in a convenient, cost-effective and private manner. Any number of local units may be located in convenient lockers accessible to recipients of parcels, this provides convenient access for recipients to pick up their packages at a location close to their home.

The locker of securable storage receptacles 12 is formed by an arrangement of multiple securable storage receptacles 14 of various sizes. Each securable storage receptacle 14 has marked on the outer surface of its door a visible identification label such as receptacle number. This identification may be permanent and be displayed as a physical sign affixed to the door; or, it may be variable and be displayed on a small monitor, such as light emitting diode (LED) display affixed to each door. Each securable storage receptacle 14 is further equipped with a door with an electrically operable locking mechanism such as a solenoid-controlled latch. Application of a signal or pulse to energize the solenoid results in movement of the latch to an unlocked position and subsequent removal of the energizing signal returns the latch to a locked position. In case of delivery of groceries, the securable storage receptacles 14 may be equipped with temperature control capability.

Local unit controller 18 includes, in one aspect, a microprocessor and memory.

5 The microprocessor of local unit controller 18 provides a number of functions based on
control code present in the memory. The specific steps and programming of the
10 functions of the microprocessor and local unit hereinafter described are well within the
skill of a person of average skill in the art of programming. In one aspect, following at
5 least one such routine, the microprocessor controls the locking/unlocking of securable
storage receptacles 14 and coordinates peripheral devices 22. The programming routines
15 and databases used for the operation of local unit 10 are situated in the memory of local
unit controller 18. The memory contains databases to allow for tracking and delivery
information recordation in order to release and secure the receptacles at required times.
20 Such databases may include a customer delivery database and a receptacle status
database. The memory may also include program routines such as a revenue tracking
routine and a receptacle assignment routine. The customer delivery database contains
recipient and parcel information such as recipient name, credit card or other payment
25 means, identifying password, contact information such as e-mail address or telephone
number, and expected parcel size, expected parcel barcode or identification number,
receptacle assignment, delivery date, and pickup date. The receptacle status database
contains information regarding the receptacles such as the size of the receptacle, status
(occupied or unoccupied), and number of days a parcel has occupied each receptacle.
30 The revenue tracking routine includes algorithms for charging service fees or late pickup
penalty and storing the revenue records. The receptacle assignment routine includes
algorithms for assigning an unoccupied appropriately sized receptacle to a parcel prior to
delivery.

35 A communications bus 16 allows for lock status, identification and other
information from the controller 18 to lockers 14. For example, local unit controller 18
25 controls the locking and unlocking of each securable storage receptacle 14 by sending
signals via communication bus 16. In one embodiment, controller 18 may include a
personal or microcomputer programmed with instructions in any of a number of
commercially available, standard programming languages.

40 A second communication bus 20 couples local unit controller 18 to input and
30 output peripherals 22. Peripherals 22 that may be used as input/output devices as part
of local unit 10 are such devices as display, card reader, bar code reader, keyboard,
printer, and security-monitoring device. It should be understood that communications bus
45 20 may comprise multiple buses to couple the peripherals to controller 18, as the case
may be. A conventional display, such as a CRT monitor, is used for the display of
35 prompts and messages. A conventional card reader, such as one based on magnetic
stripe reading, is used for input of information from recipient identification cards such as
50 credit card or other payment means. A conventional bar code reader, such as one of any

number of such readers currently being used by commercial carriers, is used for the input of parcel data. A conventional keyboard is used for the input of information such as recipient identification password, parcel data in case no bar code is present, and maintenance commands. A security-monitoring device, such as video camera or digital camera, is used to monitor and keep a record of the operation of local unit 10. The use of such security-monitoring device is for deterring any unlawful use such as credit fraud, theft, or shipping of illegal goods.

A schematic view of local unit 10 in an exemplary configuration is shown in Figure 1B. In this particular configuration, locker of securable storage receptacles 12 is situated with one of its sides bolted to local unit controller 18 and interface area consisting of peripherals 22. In this configuration, peripherals located on local unit 10 are security-monitoring device such as video camera, CRT display, card reader, printer, keyboard, and bar code reader. In this instance, all peripherals for user interface are placed close together for ease of user access.

In addition to the illustration of Figure 1B, multiple configurations of the local unit 10 may be designed to achieve its functionality. Peripherals 22 of various designs may be utilized. It is possible to use various types of displays such as CRT display, LED display, flat panel displays and the like, as a display means. Peripherals 22 may be placed in different locations. For example, a second display, a second keyboard, and bar code reader may be placed in a separate area, such as the back wall of local unit 10, covered by a door with password-entry type lock which can only be opened by service personnel or carrier personnel. In this case, the second set of display and keyboard as well as bar code reader will be used only for carrier personnel to execute delivery of parcels and for service personnel to execute servicing. Alternatively the security-monitoring device may be placed above the locker of securable storage receptacles 12. Some of peripherals 22 shown in Figure 1B may be deleted. For example, in case the receptacle access is granted based on correct password entry only and no physical identification such as credit card is required, a card reader may not be configured.

A flowchart of the method of receiving parcels utilizing local unit 10 is illustrated in Figure 2. The steps carried out for the receiving of parcels in the system and method for secure time-shared electronic access package distribution is listed in time sequential order. As an example, the steps are described in detail for an online purchase over the Internet. Nevertheless it should be recognized that the particular mode of delivery is not limited to the purchase transaction method. The alternatives for other types of shopping, such as mail-order and home-shopping via television and telephone, are described subsequent to the Internet example description.

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The receiving method begins with a customer order step 30. At the time a customer makes an online purchase over the Internet, he or she designates the intent to use the secure time-shared electronic access package distribution system receiving service (hereinafter referred to as "receiving service"). In case there are multiple locations where such receiving service is available, the customer designates which geographical location he prefers as pickup location. At step 30, recipient (i.e. customer) data such as name, credit card number or other payment means, and contact information such as e-mail address or telephone number is acquired. The customer may provide this information by communication over the Internet to local unit 10 directly, to a human representative of the receiving service, or of the merchant. This information is input into the customer delivery database within the memory of local controller 18, which resides at the customer designated geographical location. Alternatively, customer order step 30 may be initiated by a customer purchasing an item advertised on catalog, radio, or television - generally known as mail-order or home-shopping. In this case, a customer also designates his or her intent to use the service at the time of order. The customer may provide by telephone or by mail the intent to use the receiving service as well as recipient data to a representative of the receiving service or to the merchant.

Customer order step 30 is followed by a customer order acknowledgment step 32. The customer order with intent to use the delivery service of the invention is acknowledged by the issuing of a password by communication over the Internet to the customer. Alternatively, other information such as an order identification number or receptacle number (where the parcel will be stored) may be issued to the customer in addition to the password. The receptacle number will be issued to the customer in case the securable storage containers 14 are equipped to display variable receptacle numbers, as explained below. The password and other information are stored in the memory of local controller 18. The shipping address, i.e. the customer designated preferred pickup location and any other information such as order identification number, or receptacle number are issued to the merchant by communication over the Internet. If the receptacle number is issued to the merchant, the merchant is to include the receptacle number in the shipping address. Alternatively, for a mail-order or home-shopping type transaction, the communication with the customer and the merchant may be carried out by telephone or mail communication.

Acquire parcel data step 34 occurs at the time the merchant ships the parcel. At this time the parcel data, which includes the parcel's size and parcel identification, are acquired from the carrier. The carrier may issue this information by communication over the Internet, by telephone, or by mail. The parcel's size is its physical dimensions of height, width, and depth. The parcel identification may be a barcode number or other

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Identification issued by the carrier for tracking of the parcel. The parcel data is added to the customer delivery database within the memory of local controller 18.

Dynamic assignment of receptacle step 36 can occur at any time once the parcel size is acquired up to just prior to delivery of the parcel. The parcel is assigned to an unoccupied appropriately sized receptacle, which can accommodate the parcel's size. Local controller 18 makes this receptacle assignment utilizing the receptacle assignment routine. This is done based on the parcel's size and the sizes of receptacles that are open at the time. One important aspect of this method of receiving parcels is that the dynamic assignment of parcels to receptacle allows the customer to reserve and rent a receptacle when it is known that a parcel is expected. It is not necessary for the customer to pre-rent a receptacle for a pre-set duration under contractual obligation. This method of dynamic

assignment of receptacles allows users of the receiving service to time-share the use of the receptacles with other users -- utilizing a receptacle only when a parcel physically has been delivered. In this way, the number of receptacles can be minimized such that the receiving service may be offered at lower cost. Furthermore, because the number of receptacles are minimized, storage receptacles 14 of various sizes to accommodate parcels of various sizes can be built.

Receipt of parcel from carrier step 38 occurs at the time the carrier delivers the parcel to local unit 10. The carrier initiates the delivery process by inputting the parcel identification by either scanning the bar code or by typing in the parcel's identification number. Local controller 18 locates the designated parcel and the receptacle assignment in the customer delivery database. Local controller 18 displays the assigned receptacle number on display peripheral 22. Local controller 18 unlocks the assigned receptacle 14 by application of a signal. Local controller 14 will display a prompt asking the carrier whether the parcel was placed in the assigned receptacle. If the carrier responds yes, local controller 14 will lock the assigned receptacle. In case the carrier responds no, that the parcel did not fit the assigned receptacle, local controller 18 will lock the assigned receptacle then assign the parcel to a larger, unoccupied receptacle and display this newly assigned receptacle number. The unlock, prompt asking carrier if successful, and lock steps are repeated until the carrier responds that a parcel has been successfully placed in an assigned receptacle. At the time each parcel has been successfully placed in an assigned receptacle, local controller 14 will promptly ask the carrier if a receipt is needed. If the carrier responds yes, local controller 14 will print a receipt of delivery on peripheral printer 22. The delivery of the parcel is logged in the customer delivery database. The status of the receptacle is changed to occupied in the receptacle status database. Local controller 18 will send notice to the recipient of the delivered parcel by e-mail, telephone

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call, or other means notifying the geographical location of local unit 10, parcel receipt date, and the receptacle number.

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If the doors of securable storage containers 14 are equipped with displays that can display any designation for each box, receipt of parcel from carrier step 38 may be executed differently. In such a case, the receptacle number for receipt would have been included as part of the shipping information. Upon acquiring the parcel identification number and determining to which physical receptacle the parcel has been dynamically assigned to, local controller 18 will display on the assigned receptacle the pre-designated receptacle number.

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Receipt of parcel from carrier step 38 may be alternatively executed with the carrier handing over parcels to be delivered to an attendant of local unit 10. In such a case actions previously described to be actions of the carrier in step 38 will be executed by the attendant.

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Customer pickup step 40 occurs at the time the customer comes to local unit 10 for pickup of the parcel. The customer enters the password by using peripheral keyboard 22. If it is required, the system will prompt the customer to also present the physical identification or other payment means, such as credit card, automatic teller machine (ATM) card, or other smart cards. If prompted to do so, the customer presents the physical identification by using the peripheral card reader 22. Local controller 18 verifies that the password and if needed that the information from the physical identification matches those in the customer delivery database. Local controller 18 checks using the revenue tracking routine whether any fees for service or late pickup penalty needs to be charged. If any charges need to be made, the local controller displays a message notifying the customer of any charges and prompts the customer to accept the charge. Once it has been determined that no charge is necessary to the customer or the charge has been accepted by the customer, local controller 18 unlocks the assigned receptacle 14 by application of a signal. Local controller 18 keeps the assigned receptacle 14 unlocked for a predetermined length of time. After the predetermined length of time has elapsed, local controller 18 locks the assigned receptacle 14 by removal of the signal. The pickup is logged in the customer delivery database. The status of the receptacle is changed to unoccupied in the receptacle status database. Subsequently the receptacle is available for next shipment as stated in step 42.

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If necessary, customer pick-up information may be provided to the carrier or shipper as verification that the transaction was completed.

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The fee for service may be charged in various different forms. It may be charged to the customer, in which case it may be charged at the time of delivery on the credit card or other payment means the customer presents. It is also possible for the fee to be

5 charged in cash, in which case a cash collection device is equipped on the local unit. The
10 fee may also be paid for by the carrier, as it is less costly to deliver to a centrally located
local unit site than to individual residential delivery points. In this case, the number of
parcels received from a particular carrier will be tracked by the revenue tracking routine
5 and charged to the carrier by sending an invoice by Internet, telephone, or mail
communication. Alternatively, the service may be provided to a customer free of charge.
15 In this case the service may be funded by advertisements or by an establishment who
wishes to provide this as service to its customers as a means of promoting the
establishment's business.

10 Security-monitoring device peripheral 22 may be used for deterring any unlawful
use such as credit fraud, theft, or shipping of illegal goods. A video or photograph can be
20 taken while any person inputs data into using peripheral 22 or while any person opens
storage receptacle 14. For example, a video or photograph can be taken during receipt
of parcel from carrier step 38 and also during customer pickup step 40. Thus a record of
each transaction is established. The records may serve as a security means and as
15 proofs of delivery and pickup.

25 One embodiment of the method illustrated in Figure 2 will be to have it carried
out automatically such that no attendant is needed. For an automated method, steps 30,
32, and 34 will be processed on-line over a medium such as the Internet. For example,
30 in step 30 the customer will input the order with the recipient data electronically over the
Internet. In step 32, local unit 10 will issue the password to the customer electronically
over such medium as the Internet. The shipping address is issued to the merchant
electronically over such medium as the Internet. The notice given to the recipient in step
35 38 will be sent automatically by issuing an e-mail.

25 Alternatively, an attendant can manually carry out the method illustrated in Figure
2. For a manual method, steps 30, 32, and 34 will be processed manually by an
attendant. For example, the customer places an order by giving the recipient data to an
attendant by telephone or on paper. In step 32, local unit 10 will issue the password,
40 which will be notified, to the customer by an attendant. An attendant issues the shipping
address to the merchant. After receipt of the parcel, the attendant telephones the
30 recipient with the notice.

45 It is also possible to carry out some part of the method illustrated in Figure 2
automatically, while carrying out some part of the method manually.

35 Referring now to Figure 3, shown here is an alternative embodiment with multiple
local units and a central control unit. Illustrated is a block diagram of a system including
multiple local units 10 and a central control unit 52. In the embodiment shown in Figure
50 3, any number of local units may be coupled to the central controller and various aspects

5 of the processing steps heretofore described may be transferred to or recorded by the
central controller. Each local controller 18 residing at each local unit 10 is connected to
10 a central control unit 52 via a communication link 50. The central controller is further
connected to multiple customers 54, multiple merchants 56, and/or multiple carriers 58
5 via communication link 50. The communication link 50 may be telephone lines where the
communication takes place over an information system such as the Internet. Central
15 control unit 52 holds two-way communications with local controller 18 providing
information as well as receiving information. Central controller 52 also holds two-way
communications with the computers of the customers, merchants, and/or carriers. As
20 shown in this diagram, the customers, merchants, and carriers do have communication
links to each other; thus, may also directly hold two-way communications with each other
via an information system such as the internet; without involving central control unit 52.
In an alternative embodiment, direct communication between such parties is not required
and may occur through controller 52.

25 The following is a description of the operation of central controller 52 for each of
the steps described in the method of receiving parcels flowchart Figure 2. For the sake
of clarity, the operation of central controller is described with respect to an Internet
transaction. It is to be understood that all alternatives previously described for the method
is applicable for the operation of the central controller 52.

30 At customer order step 30, central control unit 52 acquires from the customer the
recipient data and the customer's choice of local unit based on preferred geographic
location. It should be understood that acquisition of such data need not be by direct
access to the customer, but may be through the carrier or the merchant. At customer
35 order acknowledgment step 32, central control unit 52 issues the access password and
any other information, such as order identification number or receptacle number, to the
customer. In various embodiments, such issuance may be communicated to the
customer via the merchant at the time of the transaction. Central control unit 52 also
40 notifies merchant 56 with whom the customer has placed the order the shipping address
of the chosen local unit 10 and any other information. At acquire parcel data step 34,
central control unit 52 acquires the parcel data (size and parcel identification number)
from carrier 58 at the time the parcel is shipped. The central controller provides the
45 recipient data, access password, and parcel data to local unit 10 where it is saved in the
customer delivery database. Based on the parcel's size and the unoccupied receptacles
at the time, local controller 18 dynamically assigns an unoccupied appropriately sized
receptacle to the parcel. Alternatively, the dynamic assignment may be done by central
50 control unit 52 then communicated to local unit 10. At receipt of parcel from carrier step
38 when local unit 10 receives the parcel from the carrier, local controller 18 sends this

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information to central control unit 52. Central control unit 52 then sends the recipient a notice via e-mail, notifying the geographic location of the local unit, parcel receipt date, and receptacle number. As an option, central control unit 52 may also send a notice to the merchant notifying the receipt date of the parcel. At customer pickup step 40, local unit 10 will notify central controller 52 of the pickup event as well as any revenue related information.

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As an option, central controller 52 may be used to maintain a host database. In this case, local units 10 will send updates of the local databases to central controller 52. Such data in the host database may be used for analysis purposes. As an option, central controller 52 may be also used for overall tracking of parcels. In this case after the order is received and acknowledged, the customer, merchant, or carrier may communicate with central control unit 52 to determine the status of a parcel. Central control unit 52 will respond to the inquiry with the status of the parcel, such as: awaiting delivery by merchant, in transport by carrier, delivered to a particular local unit and awaiting pickup, or picked up by customer.

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A variation of the system with the central control unit 52 residing with a carrier is illustrated in Figure 4. In Figure 4 there are multiple local units 10, multiple customers 54, and multiple merchants 56 all connected via communication link 50 to a central control unit 52 which resides in a carrier 58. This is an embodiment where a carrier manages the system, including local units 10 and central control unit 52. In this case by communicating to central control unit 52, the customers and merchants are in effect communicating with the carrier. The central control unit operates in the same way as was described for Figure 3.

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It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts as well as order of steps within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

Claims

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CLAIMS

What is claimed is:

1. A method for receiving parcels, comprising:
- (a) providing a plurality of controlled receptacles;
 - (b) acquiring recipient data and parcel data;
 - (c) dynamically assigning an appropriately sized receptacle based upon parcel size data prior to the delivery of the parcel;
 - (d) accepting delivery of a parcel to said receptacle;
 - (e) identifying the recipient upon presentation of identification by the recipient; and
 - (f) releasing the parcel to the recipient.

2. The method of claim 1 wherein said step (b) includes acquiring said recipient data directly from a recipient.

3. The method of claim 2 wherein said step (b) includes acquiring said parcel data from a parcel carrier.

4. The method of claim 2 wherein said step (b) includes acquiring said parcel data from a merchant.

5. The method of claim 1 wherein said step (b) includes acquiring said recipient data and parcel data from a parcel carrier.

6. The method of claim 1 wherein said step (b) includes acquiring said recipient data and parcel data from a merchant.

7. The method of claim 1 wherein said step (c) occurs in a period between a point in time just following completion of step (b) to just prior to parcel delivery.

8. The method of claim 7 wherein said step (c) occurs just prior to parcel delivery.

9. The method of claim 1 wherein said step (d) includes the substeps of:
- (d1) identifying delivery of the parcel by reference to the parcel data;
 - (d2) granting access to said appropriately sized receptacle; and

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(d3) securing said appropriately sized receptacle upon an indication that the parcel has been placed therein.

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10. The method of claim 1 wherein said steps (b) through (e) are performed by an automated controller and programming code.

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11. The method of claim 1 wherein said method further includes the step of:
(g) releasing said appropriately sized container to accept delivery of another parcel.

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12. The method of claim 1 wherein said step (e) comprises identifying said recipient based on an access code.

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13. The method of claim 1 further including the step of providing the recipient with an access code as said identification.

14. The method of claim 1 wherein said step (b) occurs before or when a merchant ships the package.

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15. The method of claim 1 wherein said step (d) further includes the step of notifying a recipient of the delivery of said parcel.

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16. The method of claim 1 wherein said step (f) further includes the substeps of:

(f1) identifying the appropriately sized receptacle containing the parcel to the recipient; and

(f2) providing access to the appropriately sized receptacle.

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17. A method for controlling a plurality of securable storage containers, comprising:

(a) acquiring and storing data on the status of each of the plurality of storage containers, including whether the container is full or empty and the size of the container;

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(b) acquiring and storing a list of recipients and parcel sizes to be stored in ones of said plurality of containers;

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(c) assigning an appropriately sized container for a parcel delivery prior to the delivery of the parcel;

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(d) identifying the recipient when the recipient demands access to the container to retrieve the parcel; and

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(e) releasing access to the container upon demand and identification by the recipient.

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18. The method of claim 17 wherein steps (a) through (e) are performed by a microcontroller operating under programming code.

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19. The method of claim 17 wherein said step (b) includes acquiring said list and sizes from a merchant.

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20. The method of claim 17 wherein said step (b) includes acquiring said list and sizes from a shipper.

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21. The method of claim 17 wherein said step (c) occurs in a period between a point in time just following completion of step (b) to just prior to parcel delivery.

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22. The method of claim 17 wherein said step (c) occurs just prior to delivery of the parcel.

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23. The method of claim 17 wherein said step (e) further includes the substeps of:

- (e1) identifying the receptacle containing the parcel to the recipient; and
- (e2) allowing access to the receptacle.

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24. The method of claim 17 wherein said step (d) includes identifying the recipient by an access code.

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25. A secure parcel storage system, comprising:
a plurality of securable storage containers;
a controller coupled to the securable storage containers; and
a memory, coupled to the controller, and containing
a database of parcel delivery and recipient information,
a database of container status, and
program code for directing the controller to allow access to the storage containers, and dynamically assigning containers to allow parcels to be stored in ones of the plurality of securable storage containers.

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26. The system of claim 25 wherein said plurality of containers include locks coupled to and operable by said controller.

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27. The system of claim 25 wherein said containers contain a dynamic display.

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28. The system of claim 25 wherein said database further includes container size data.

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29. The system of claim 25 further including an I/O unit to receive data for each said database.

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30. The system of claim 29 wherein the I/O unit includes peripherals allowing recipient and carrier input and output.

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31. The system of claim 29 wherein said I/O unit is coupled to a parcel carrier service.

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32. The system of claim 25 wherein said plurality of containers, controller and memory are provided in a local unit, and the system includes a plurality of local units.

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33. The system of claim 32 wherein the system further includes a central controller coupled to a plurality of said local units, the central controller providing said database information.

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34. The system of claim 25 further including revenue acquisition and tracking code.

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36. A secure parcel storage system, comprising:
a plurality of securable storage containers;
a central controller, the central controller providing information concerning parcel delivery, including recipient package size:
a local controller coupled to the central controller and coupled to the securable storage containers;
a memory, coupled to the local controller, and storing

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a database of the parcel delivery and recipient information;
a database of container status, and
program code for directing the controller to allow access to the
storage containers, and dynamically assigning containers to allow parcels
to be stored in ones of the plurality of securable storage containers.

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37. The system of claim 36 wherein the central controller includes an
interface to a parcel carrier.

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38. The system of claim 36 wherein the central controller includes an
interface to a merchant.

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39. The system of claim 36 wherein the central controller contains said
database of said information containing parcel delivery and said database of container
status.

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40. The system of claim 36 wherein the central controller is maintained by
the carrier.

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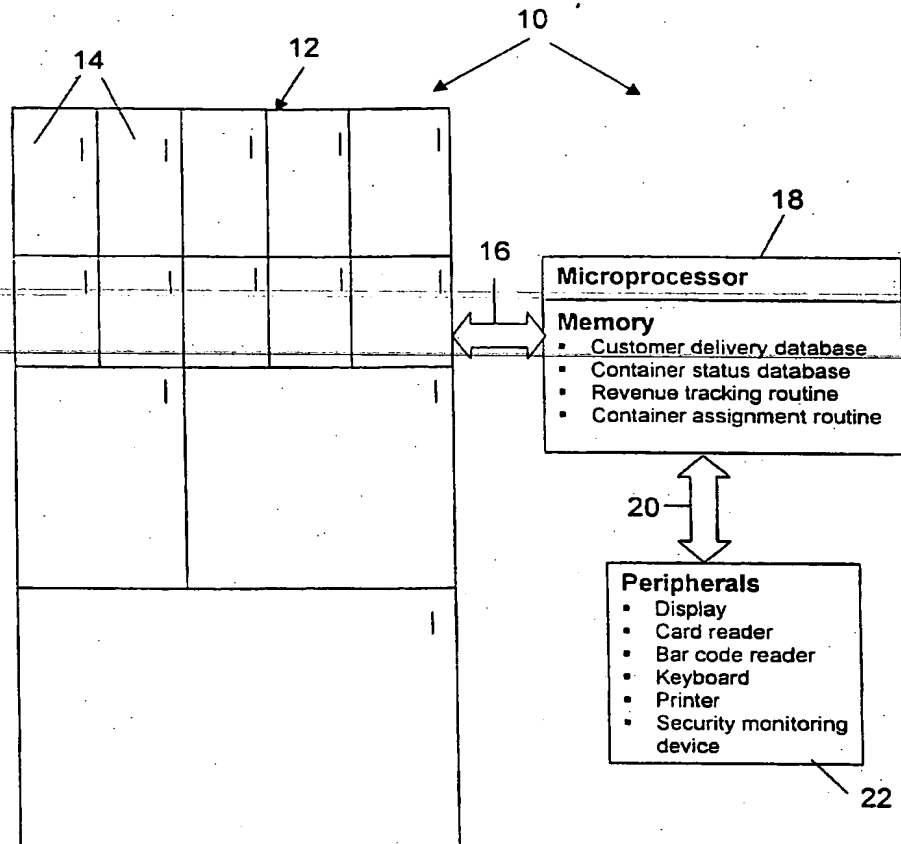


FIG. 1A

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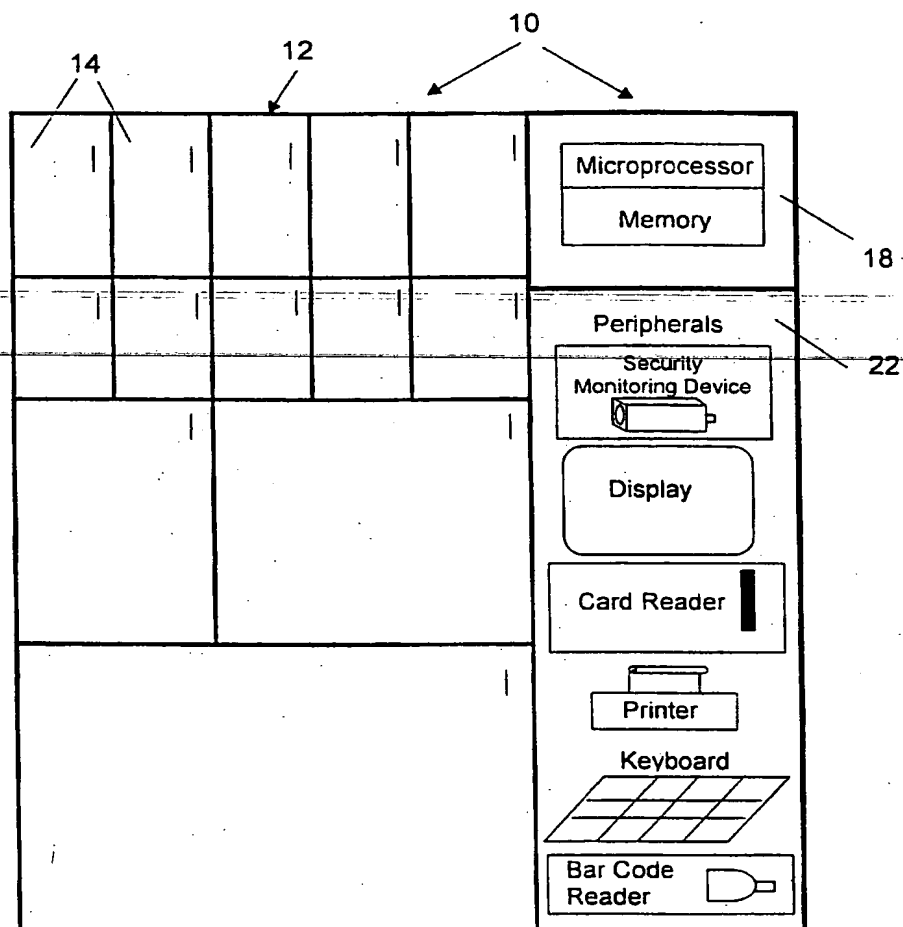


FIG. 1B

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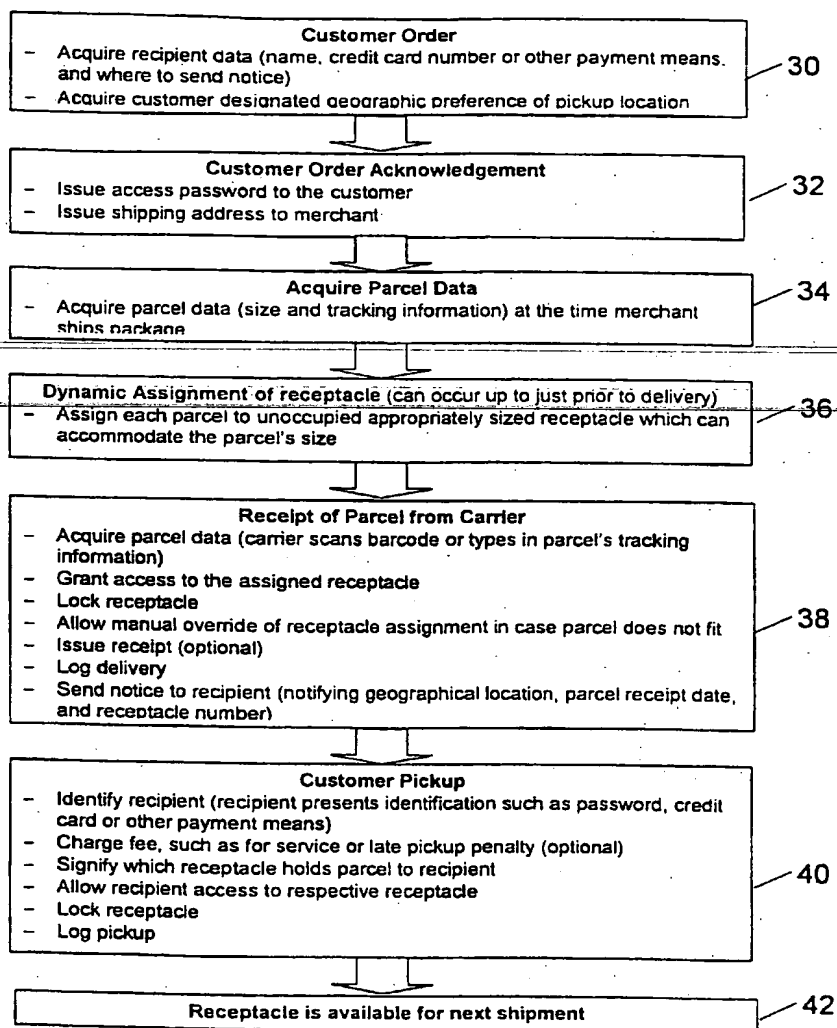


FIG. 2

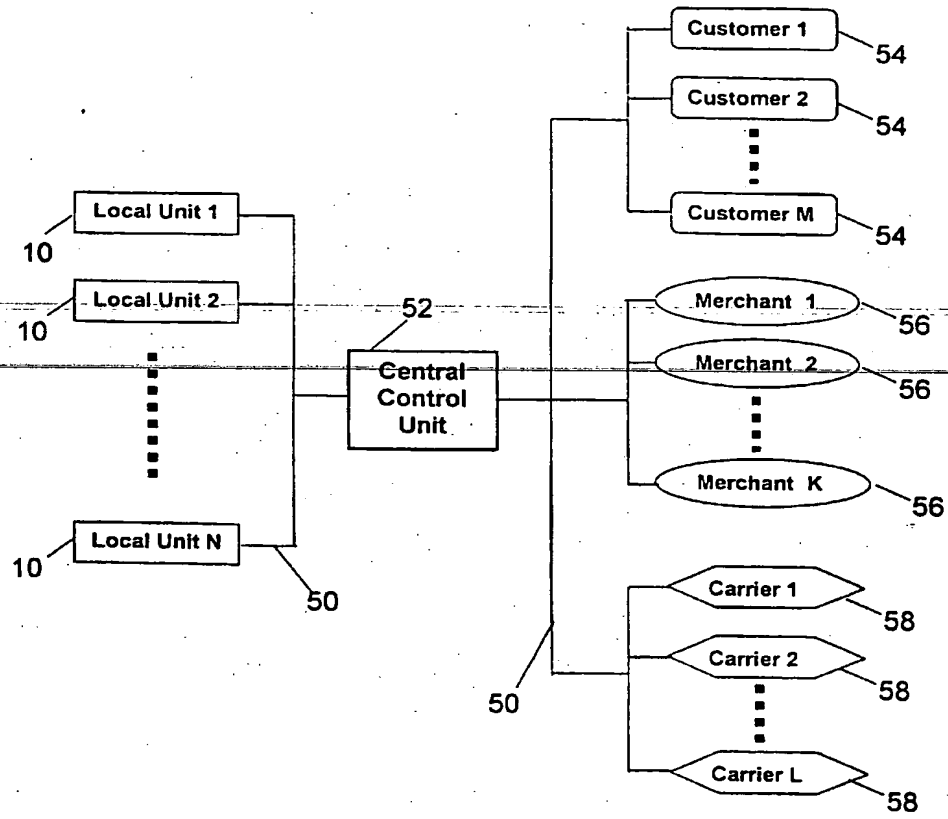


Fig. 3

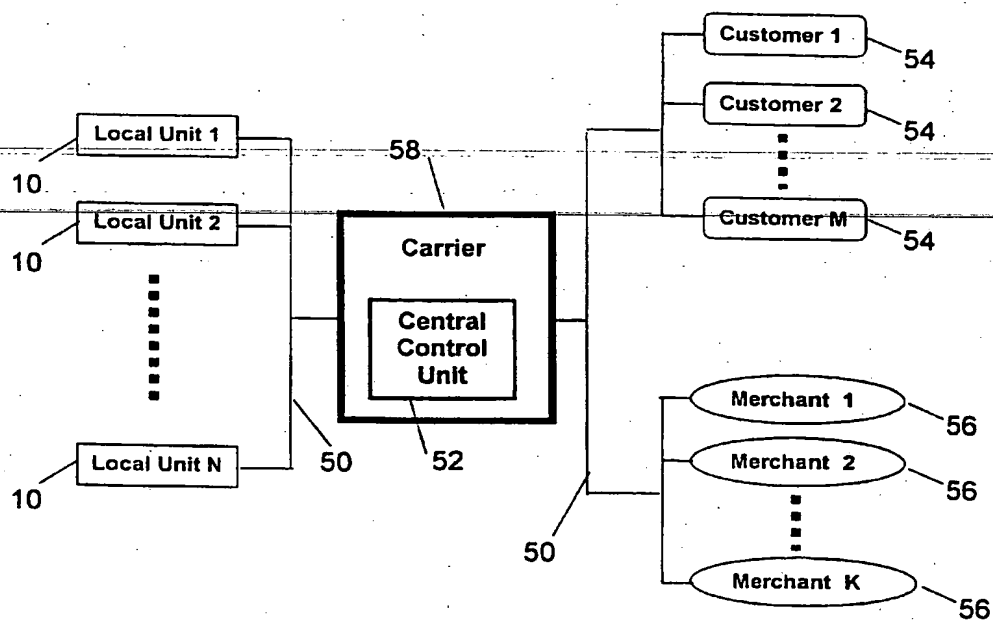


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/05663**A. CLASSIFICATION OF SUBJECT MATTER**IPC(7) : B07C 5/00; G06F 7/00
US CL : 209/630,559,942; 700/213,225

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 209/546,630,559,942; 700/213,215,218,225

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST searched.**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E, X	US 6,076,023 A (SATO) 13 June 2000 (13/06/00) see the entire document.	1-40
P, A	US 5,971,592 A (KRALJ et al.) 26 October 1999 (26/10/99) see the entire document.	
P, A	US 5,903,878 A (TALATI et al.) 11 May 1999 (11/05/99) see the entire document.	
A	US 5,475,378 A (KAARSOO et al.) 12 December 1995 (12/12/95) see the entire document.	

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	* Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

19 JUNE 2000

Date of mailing of the international search report

12 JUL 2000

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